Global Ocean Monitoring and Observing
NATIONAL OCEANIC & ATMOSPHERIC ADMINISTRATION

Argo's technology advancements

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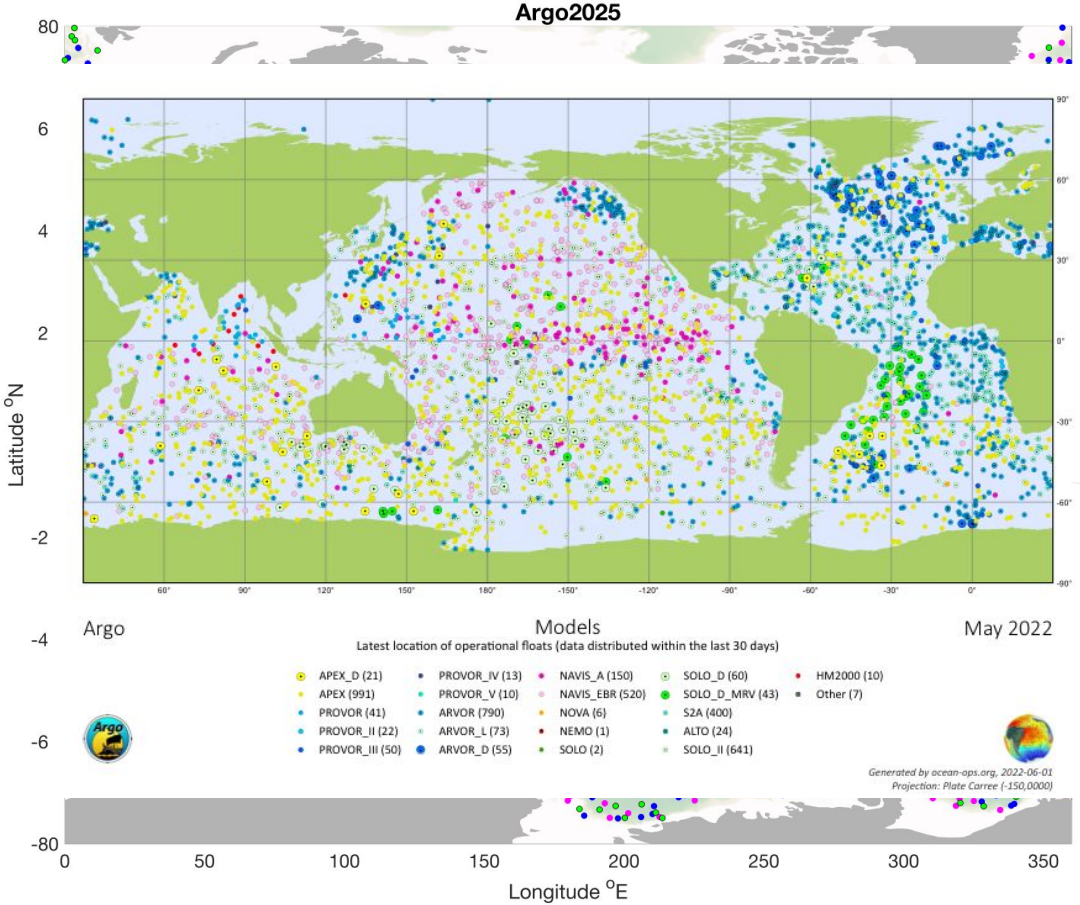
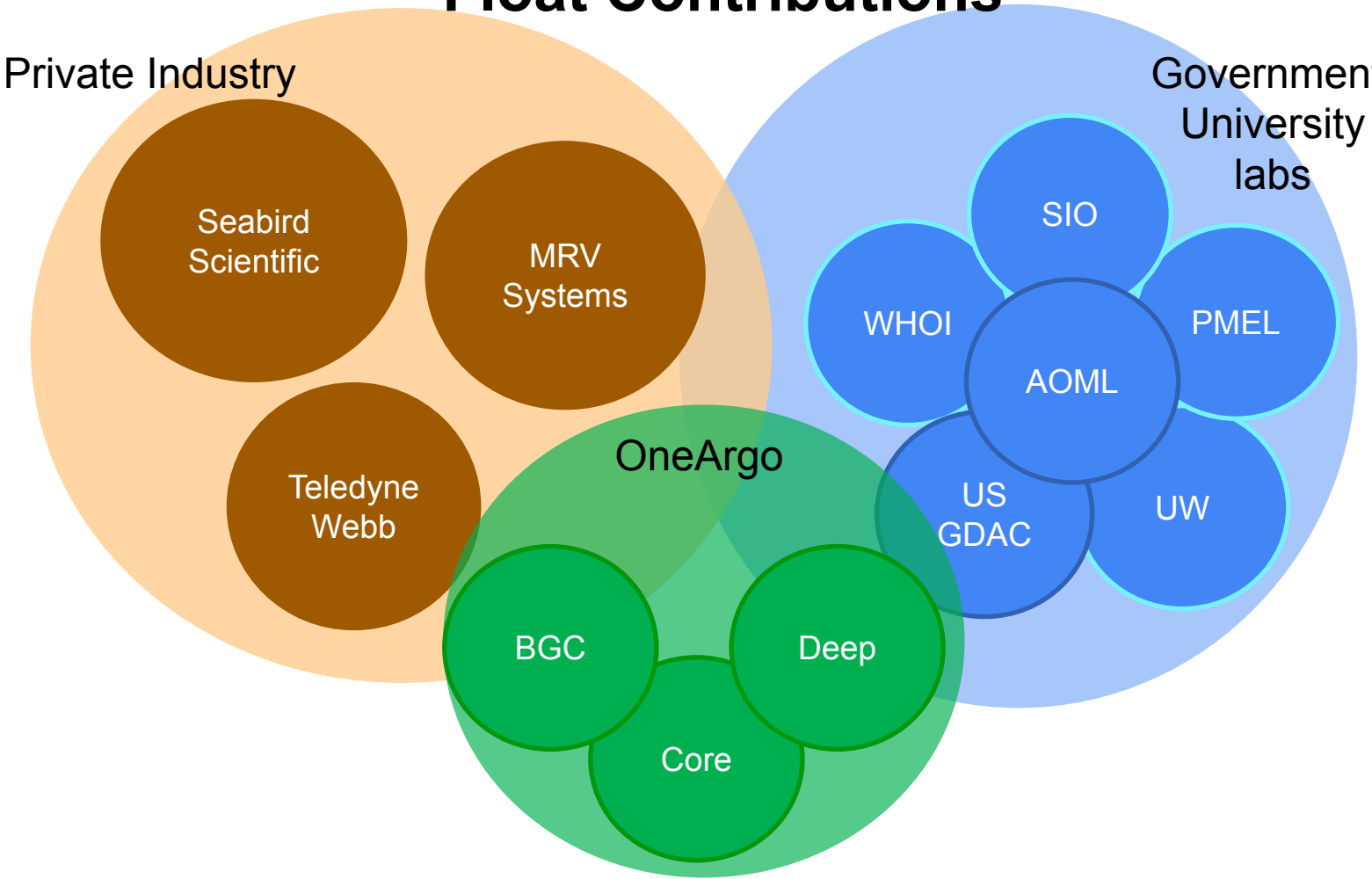
GOMO's technology investment: Past to future

- **Autonomous observations are synonymous with robotic technology**
- Continuous technology investments are needed to **maintain and expand** the Argo program
- Technology development is an incremental process: investment needs to be done years in advance to prepare for future needs
- Autonomous platforms are instrumental contributors to a sustainable, innovative, valuable and integrated global ocean observing system



Float Contributions



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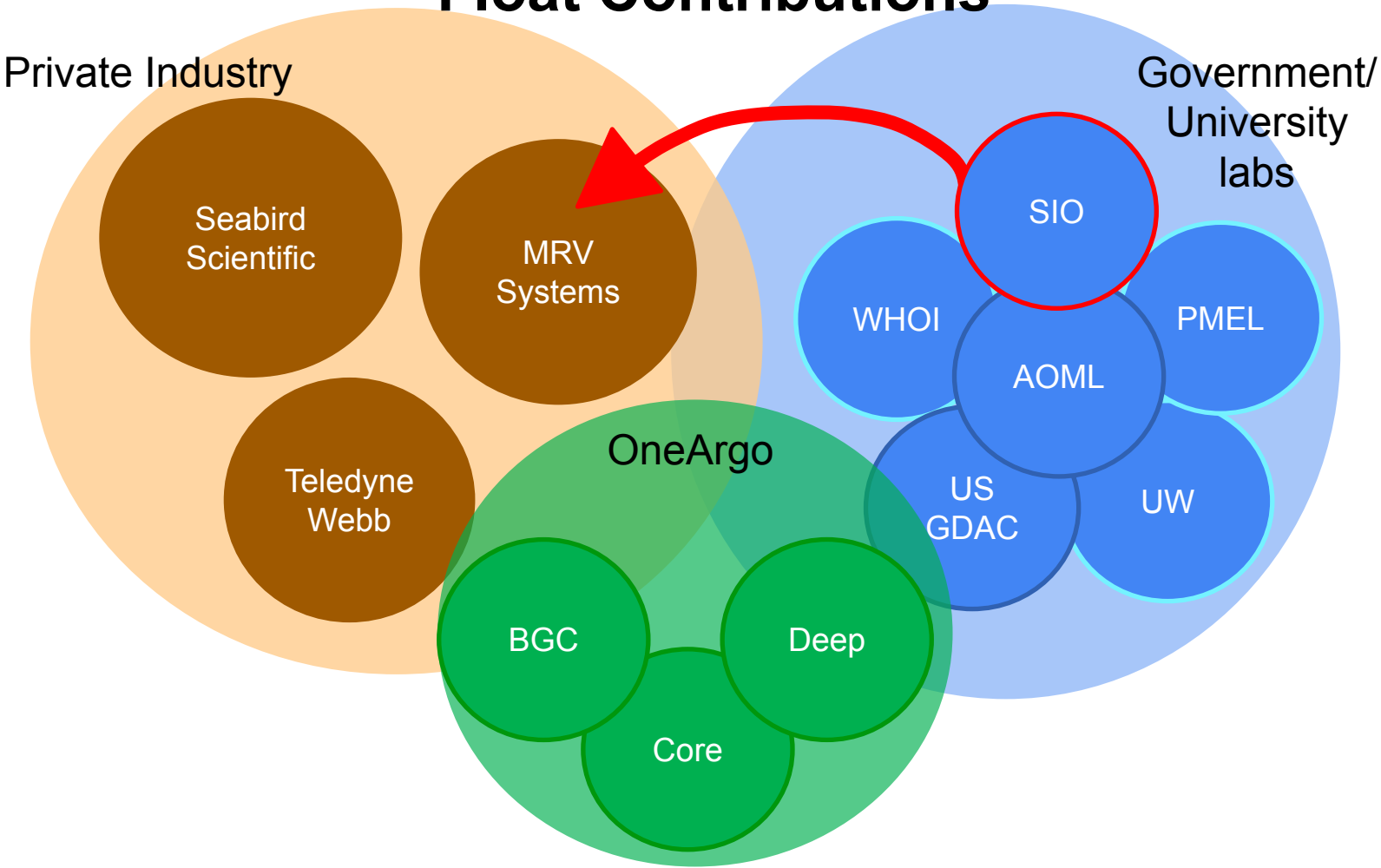

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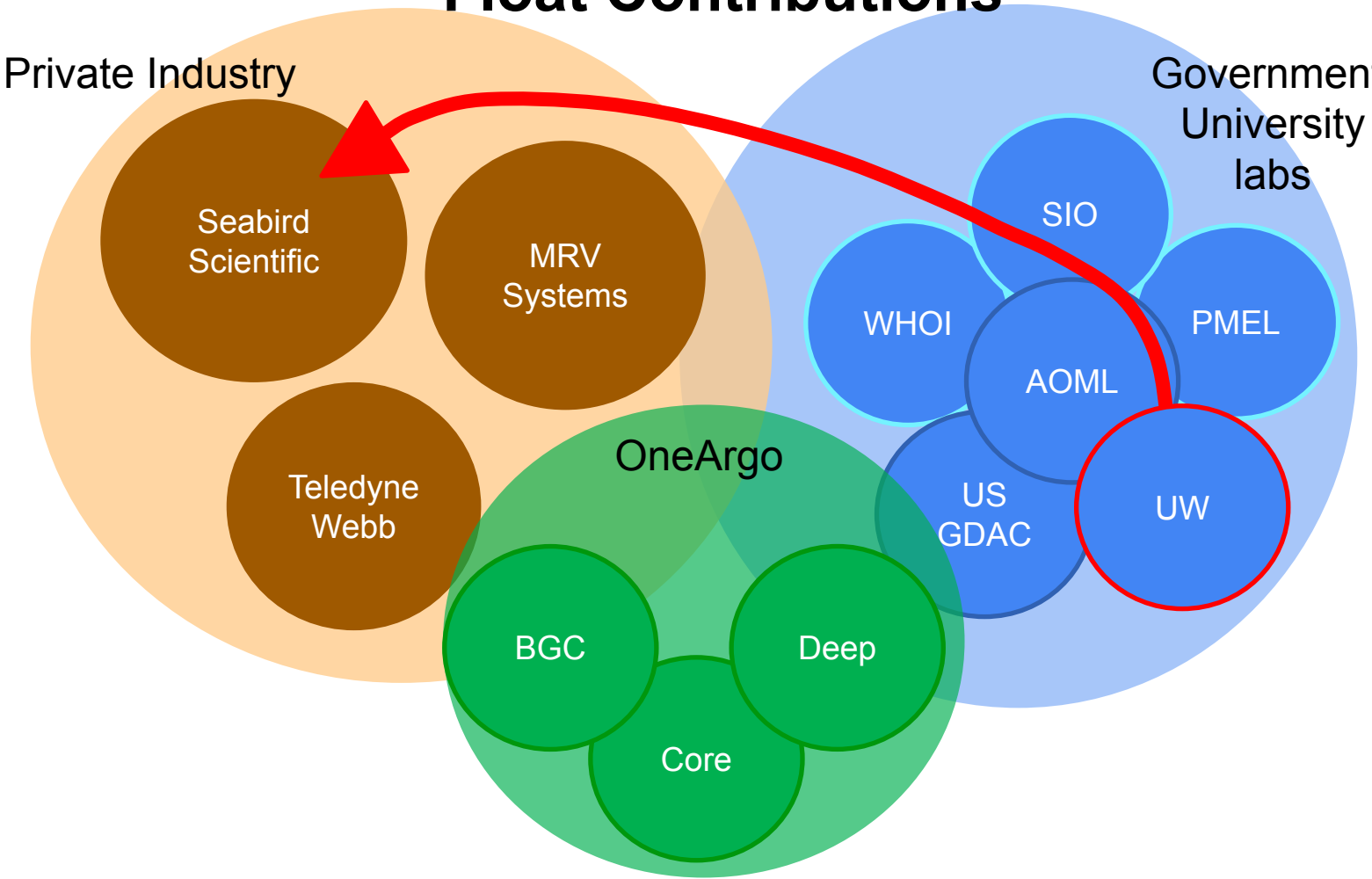
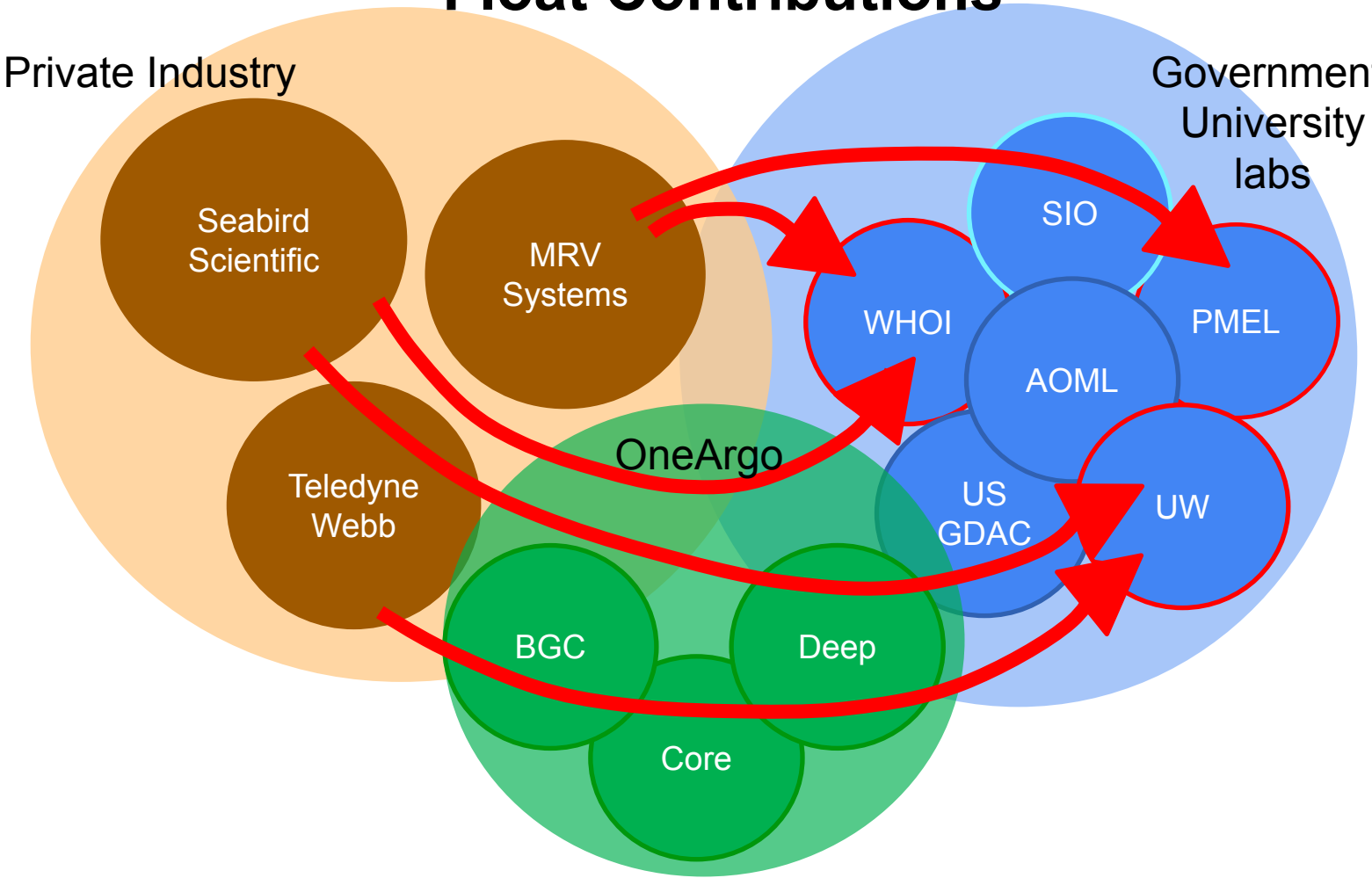


Float Contributions

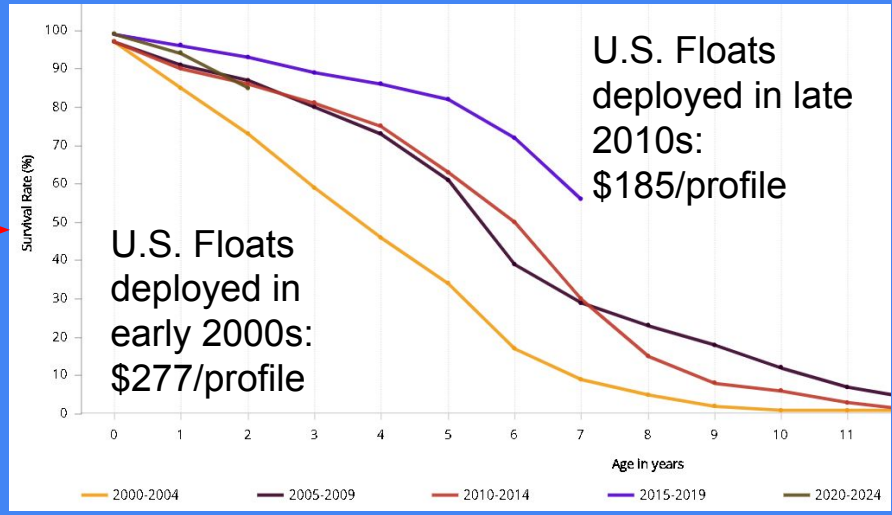


GOMO's investment in float technology

GOMO's investment

- Continued development of the Iridium communication
- Increased float battery efficiency
- Software improvements
- Bottom detection
- Ice detection
- Integration of new sensors
- Testing of sensor and float performances
- Monitoring of sensor performance and providing direct feedback to industry
- Continued investment in data management and QC

Impact on Argo



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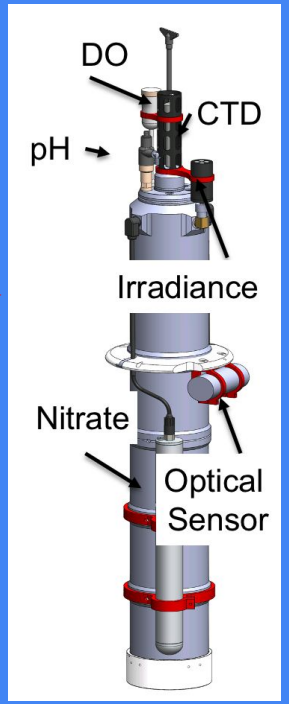
MRV Systems

Teledyne Webb

GOMO's investment in the BGC SOLO (NOPP)

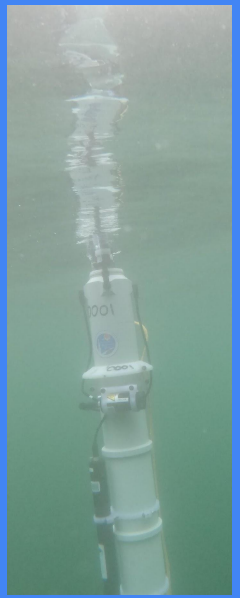
GOMO's investment

- Develop a new model of BGC Argo float based on the reliable SOLO-II
- Carry all 6 required BGC sensors
- 6+ years of life expectancy
- Expands US's manufacturing capability to support OneArgo's need



Results

4 floats deployed to date
First US float to carry all 6 BGC sensors



MRV Systems

GOMO's investment in the BGC NAVIS & Sensors (NOPP)

GOMO's investment

- Work with SBE to develop
  - O_2 sensor within air capabilities,
  - Improved pH sensor,
  - New fluorometer that measures 435nm in addition to 455nm
- Integrate a radiometer on an APEX to become a 6-sensor float
- Increase volume of NAVIS to add batteries and increase lifetime and performance

Results

[5 prototypes deployed]

[4 prototypes deployed]

[4 prototypes deployed]

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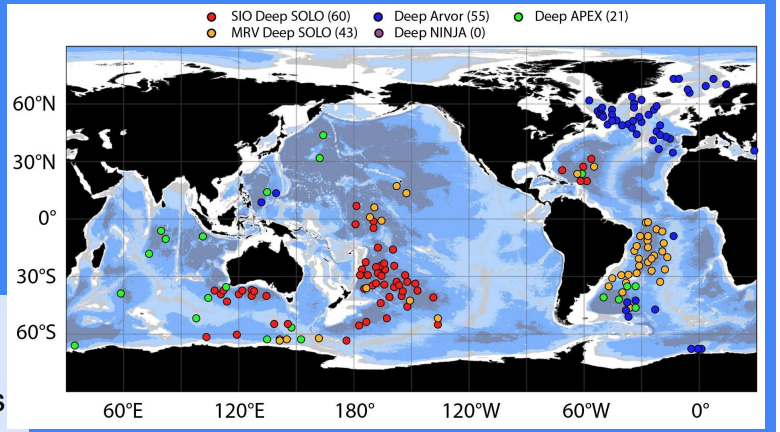
GOMO's investment in the Deep SOLO (NOPP)

GOMO's investment

- Develop a Deep Argo float model capable of profiling to 6000-m depth within 3 m of the seafloor
- Develop a Deep Argo SBE CTD approaching GO-SHIP pressure, temperature, and salinity accuracies
- 6+ years of estimated lifetime

- 6 NOPP Deep SOLOs deployed April 2021, 6 additional NOPP deployments scheduled November 2022

Results



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- SIO-SBE NOPP to test new pressure sensors and improve salinity measurements

MRV Systems

- Deep SOLO licensed to MRV systems in 2015
- 60 SIO and 43 MRV Deep SOLOs are active

Future plans and opportunities

- Autonomous ocean observing is dependent on continuous innovation, both of current and envisioned sensors and platforms
- GOMO fills a pivotal role in the ocean observing network through sustained investment in robotic technology development
- Technology investment goes beyond Argo, eg Gliders
- Argo has long standing co-depended relationships with the private sector, providing an excellent example of how government investment can be mutually beneficial to academia and industry and excel innovation.

- Deep Argo is at a crossroad where additional funds are urgently needed to sustain investments from float and sensor manufacturers and maintain credibility to the scientific community that a global Deep Argo array will be implemented
- Additional funds are needed to support collaborations between manufacturers and U.S. float providers to continue advances in Argo CTD and float technology.

Additional Slides